


Corrective Action Completion Report

**Chirano Gold Mines Ltd.
Chirano Mine**

(a Kinross Gold Corporation Operation)

Chirano
Name of Mine

22 August 2014
Date

 ENVIRON CORRECTIVE ACTION PLAN ICMC Certification Audit – Chirano Mine	Control No.: <u>CGML-ICMC-CAR-01</u> Date issued: February 14, 2012
ICMC Standard of Practice Section Reference: 4.7(2)	
Description of Deficiency: The CIL impoundment plus the existing Event Pond do not provide containment capacity sufficient to contain a nominal 110% of the largest contained tank plus piping system flow back.	
Corrective Action Required (describe/attach supplemental information as necessary): CGML will need to modify the existing CIL + Event Pond containment arrangement, modify the uses of other containment structures or construct a new containment facility to provide the required containment for the CIL area. Since the CIL area is unroofed, additional capacity for the 100-year design storm event and other volumes that may be consumed by other routine uses of the Event Pond must also be considered. All modifications will be subject to the change control process described in standard of practice 4.1(4) and the QA/QC program documentation requirements described in 4.8.	
Evidence Required for Verification of Corrective Action Completion: <ul style="list-style-type: none"> • Sketches or drawings of modified containments, as appropriate, plus procedures describing how containment arrangements are to be managed in the event of a process spill; • Completed change request form (and AFE, if used); • Photographs and QA/QC inspection reports for any required modifications; and • Modified inspection forms that demonstrate an appropriate inspection frequency for new or modified containment areas 	
Evidence Provided to Verify Completion of Corrective Action: <ul style="list-style-type: none"> • CGML designed a system whereby the existing Event Pond (a.k.a. Event Pond #1), a downgradient Tailings Pipeline Event Pond (a.k.a. Event Pond #2), and a welded HDPE-lined Tailings Pipeline Channel interconnecting the two ponds can be employed in combination to provide emergency containment well in excess of the requirements of Standard of Practice 4.7(2) in the event of a catastrophic failure of a tank within the CIL bund. A calculation summary provided by CGML (August 2014) indicates that the maximum volume provided by this system is 6853m³, or 214% of the volume of the largest tank contained in the CIL (3200m³); the additional capacity provide by the existing concrete bund in the CIL area is not included as part of this calculation, and represents an additional potential 	

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containment reserve. Operating parameters established for the two Event Ponds commit CGML to keep the ponds pumped below 20% of the available volume at all times; assuming the minimum available volume of the two ponds is 80% of the theoretical maximum, then the total worst case available containment in the event of a CIL emergency is 5971m³, or approximately 187% of the volume of the largest tank contained in the CIL.

Detailed design specifications were provided for the Tailings Pipeline Channel Design (Golder Associates Ghana, June 2013) and Event Pond Drain Design (Golder Associates Ghana, February 2013). A new SOP was also provided for review (CM/PP/RG-CN-00, "Handling Minor/Major Spills from CIL Tanks") that describes how to use the newly expanded containment system in the event of a major spill. Records of training for affected operators and supervisors in the requirements of the new SOP were also provided for review.

- A copy of the completed Change Management Request Form generated for these modifications (MOC-CH-PP-01, March 33, 2014) was provided for review. No AFE was required to effect these changes.
- A comprehensive QA/QC inspection report (Knight Piésold, August 14, 2014) signed by a qualified engineer was provided for review, and included photographs and inspection records for pond liner repairs, pond relining/ double-lining operations, installation of inspection ports, placement and welding of tailings pipeline trench liner materials, pressure testing of pipeline components, and other construction details. The report also laid out a general inspection methodology that has been extrapolated for annual preventive maintenance (PM) inspections of system components; general details for these inspections (which are to be done by a qualified independent contractor) are carried in the JD Edwards PM system.
- Copies of monthly operator inspection checklists were also provided for review that indicate that all elements of the containment system are being routinely inspected.

Corrective Action Completion Date: Extension to August 31, 2014 granted by ICMI on 5/27/2014

Closure Verified:




Lead Auditor: Glenn Mills

Date: 22 August 2014

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 <p style="text-align: center;">ENVIRON CORRECTIVE ACTION PLAN ICMC Certification Audit – Chirano Mine</p>	<p>Control No.: <u>CGML-ICMC-CAR-02</u></p> <p>Date issued: February 14, 2012</p>
<p>ICMC Standard of Practice Section Reference: 4.8.5</p>	
<p>Description of Deficiency: No QA/QC documentation is available for the Event Pond, Decant Water Pond, Raw Water Pond, associated sedimentation ponds, pumps and connecting pipelines, the tailings and reclaim water return pipelines, and the tailings pipeline spill containment pond.</p>	
<p>Corrective Action Required (describe/attach supplemental information as necessary): Where there is no available QA/QC documentation or as-built certification for cyanide facility construction, an appropriately qualified person must be tasked with inspecting those elements of the facility involving cyanide and issued a report concluding that its continued operation within established parameters will protect against cyanide exposures and releases.</p>	
<p>Evidence Required for Verification of Corrective Action Completion: Provide one or more reports documenting qualified, independent reviews of the as-constructed:</p> <ul style="list-style-type: none"> • Event Pond, • Decant Water Pond, • Raw Water Pond, • associated sedimentation ponds, pumps and connecting pipelines, and • the tailings and reclaim water return pipelines, and tailings pipeline spill containment pond. <p>The intent of these reports is to demonstrate that the continued operation of these facilities within established parameters will protect against cyanide exposures and releases.</p>	
<p>Evidence Provided to Verify Completion of Corrective Action:</p> <ul style="list-style-type: none"> • A comprehensive QA/QC inspection report (Knight Piésold, August 14, 2014) signed by a qualified engineer was provided for review, and included detailed photographs and inspection records for pond liner repairs, pond relining/double-lining operations, weld testing, pressure testing of pipeline components, and other construction details. It is noted that the raw water pond listed in the previous box does not contact cyanide and should not be considered a cyanide facility <i>per se</i>, but was nevertheless inspected and repaired as part of the independent engineer’s inspection. 	

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Corrective Action Completion Date: 28 June 2014; extension to August 31, 2014
granted by ICMI on 5/27/2014

Closure Verified:




Lead Auditor: Glenn Mills

Date: 22 August 2014


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 <p style="text-align: center;">ENVIRON CORRECTIVE ACTION PLAN ICMC Certification Audit – Chirano Mine</p>	<p>Control No.: <u>CGML-ICMC-CAR-03</u></p> <p>Date issued: February 14, 2012</p>
<p>ICMC Standard of Practice Section Reference: 6.2(3)</p>	
<p>Description of Deficiency: There is no self-contained breathing apparatus (SCBA) capability at the process plant site that permits a timely response to a man-down cyanide exposure emergency; no formal respirator training program is currently provided</p>	
<p>Corrective Action Required (describe/attach supplemental information as necessary): CGML must to implement a formal respirator program that includes initial and refresher fit-testing and record keeping program. CGML must also</p> <ul style="list-style-type: none"> • Acquire and maintain at the plant site sufficient SCBA units to be able to respond quickly in a high HCN gas situation; • Train operators and/or emergency response team (ERT) members in use and maintenance of SCBA units. 	
<p>Evidence Required for Verification of Corrective Action Completion:</p> <ul style="list-style-type: none"> • Copies of respiratory protection program plan or SOPs; • Purchase orders and photographs of received SCBA units; • Copies of SCBA training records; and • Copies of training and fit-testing records for operators and maintenance personnel required to use full-face respirators for cyanide related activities 	
<p>Evidence Provided to Verify Completion of Corrective Action:</p> <ul style="list-style-type: none"> • Purchase Order and photos for five SCBAs (bottles, storage cases, trailer); • SCBA training records and photos of training sessions • SOP CM/PP/RPP-01 - Respiratory Protection Plan, January 2013 • Training records for respirator use and fit-testing • Sample (20) of fit test records • SCBA and fit-testing training materials • Trainer's qualification certificate (MSA) • Service and Test intervals for breathing apparatus 	
<p>Corrective Action Completion Date: Extension to August 31, 2014 granted by ICMI on 5/27/2014</p>	

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<p>Closure Verified:</p> <p></p> <p>Lead Auditor: Glenn Mills</p>	<p>Date: 22 August 2014</p>
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 ENVIRON CORRECTIVE ACTION PLAN ICMC Certification Audit – Chirano Mine	Control No.: <u>CGML-ICMC-CAR-04</u> Date issued: February 14, 2012
ICMC Standard of Practice Section Reference: 6.2(4)	
Description of Deficiency: CGML needs to modify the calibration schedule for portable gas monitors to comply with the manufacturer’s recommended frequency of 90 days when the monitors are to be used for detection of HCN. Also, fixed HCN monitors are being calibrated by comparing readout against a portal HCN meter and not as recommended by the manufacturer.	
Corrective Action Required (describe/attach supplemental information as necessary): In order to achieve full compliance under this Standard of Practice, CGML must complete the following corrective actions: <ul style="list-style-type: none"> • Change the calibration schedule for the portal monitors from 180 days to 90 days as recommended by the manufacturer; and • Calibrate the fixed HCN monitors as recommended by the manufacturer. 	
Evidence Required for Verification of Corrective Action Completion: <ul style="list-style-type: none"> • Copy of revised Preventive Maintenance (PM) schedule for each portable HCN monitor; and • Copies of PM schedule for each fixed HCN monitor and a completed calibration record for each monitor. 	
Evidence Provided to Verify Completion of Corrective Action: <ul style="list-style-type: none"> • SOP CM/PP/05 – Cyanide Gas Monitor Calibration Procedure, April 2014; • Copy of preventative maintenance tracking register showing schedule for HCN monitor maintenance; • Copy of “HCN Gas Monitors Register” listing all active HCN monitors • Calibration records for fixed HCN monitors (4 monitors) • Calibration records for Portable HCN Monitors (11 monitors) • Calibration Records of multi-gas portable monitors that include HCN gas (2 monitors) 	
Corrective Action Completion Date: Extension to August 31, 2014 granted by ICMI on 5/27/2014	

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<p>Closure Verified:</p> <p><i>Smith</i></p> <p>Lead Auditor: Glenn Mills</p>	<p>Date: 22 August 2014</p>
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 <p style="text-align: center;">ENVIRON CORRECTIVE ACTION PLAN ICMC Certification Audit – Chirano Mine</p>	<p>Control No.: <u>CGML-ICMC-CAR-05</u></p> <p>Date issued: February 14, 2012</p>
<p>ICMC Standard of Practice Section Reference: 8.1(1) and 8.2(7)</p>	
<p>Description of Deficiency: Cyanide awareness training and cyanide task training records appear to be incomplete</p>	
<p>Corrective Action Required (describe/attach supplemental information as necessary): CGML must compile and maintain a summary list of all workers required to complete cyanide awareness training that includes the dates the training of each individual was completed, and the name of the trainer that conducted the training. A summary list is also required to be compiled and maintained that includes required cyanide task training for each worker that includes the dates the training of each individual for each task was completed, and the name of the trainer that conducted the training.</p>	
<p>Evidence Required for Verification of Corrective Action Completion: Copy of the summary lists for cyanide awareness and cyanide task training demonstrating that all workers that encounter cyanide have completed cyanide awareness training and are trained to competently perform the cyanide related work tasks they have been assigned.</p>	
<p>Evidence Provided to Verify Completion of Corrective Action:</p> <ul style="list-style-type: none"> • Process Training Attendance Sheets for task and cyanide awareness training conducted in May 2013. Sheets provide training topic(s), trainer name and signature, date of training, and name and signatures of each attendee; • Monthly training report for June 2013; • Example written test report and grading; and • Summary Spreadsheet of Cyanide Training – 2013/2014 for tracking training requirements. Spreadsheet summarizes cyanide training requirements, training completed, and training scheduled for each person in each job position. 	
<p>Corrective Action Completion Date: Extension to August 31, 2014 granted by ICMI on 5/27/2014</p>	
<p>Closure Verified:</p>  <p>Lead Auditor: Glenn Mills</p>	<p>Date: 22 August 2014</p>

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